addition of the installation of a pump and treat system before discharge to the local POTW.

The estimated present worth cost of Alternative G4 is $1,700,000. This cost includes the in-situ geochemical fixation, which treats the arsenic and provides a similar monitoring for natural attenuation as mentioned in Alternative G2.

The estimated present worth cost of Alternative G5 is $6,600,000. These costs include the entire construction of the treatment buildings, associated piping, and extraction wells, along with O&M costs over a 10-year period. Much of the construction and O&M costs are derived from conservative assumptions regarding the degree of pretreatment required prior to discharge to the POTW.

The costs for Alternatives G3, G4 and G5 are based upon current groundwater conditions. The groundwater remedial action is expected to follow completion of a soil remedy for the site, and the remediation costs may be lower and time frames shorter after the soil remedy is completed. This cost consideration is expected to affect the three alternatives equally.

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.

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8. State acceptance

Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure.

The State of New Jersey concurs with EPA's Selected Remedy.

9. Community acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial response measures proposed for the site. Oral comments were recorded from attendees of the public meeting. Written comments were received from the Edison Wetlands Association and a group of PRPs.

During oral comment (at the July 26, 2005 public meeting), a number of commenters expressed reservations about EPA's Proposed Plan, focusing in particular on the selection of remediation goals based upon commercial/industrial reuse instead of unrestricted use, and Environmental Justice concerns in Camden. Comments from the PRPs evaluated a whole range of technical issues, and recommend alternative remedies for addressing the site that are similar to FS Alternatives S3 and G4.

In Appendix V, the Responsiveness Summary addresses all comments received, both verbal and written.

PRINCIPAL THREAT WASTE

This response is considered the final remedy for all source soil material and contaminated groundwater at the site. EPA concluded that soils contaminated with arsenic at concentrations greater than 300 ppm, and VOC-contaminated soil at concentrations greater than 1 ppm total VOCs - the Source Area soils - constitute principal threats at the site.

SELECTED REMEDY

Based upon consideration of the results of the site investigation, the requirements of CERCLA, the detailed analysis of the response measures, and public comments, EPA has determined that Alternative S4, excavation and off-site transportation of Source Areas with treatment as necessary prior to land disposal, and capping residual soils, is the appropriate remedy for addressing the contaminated soil; and Alternative G5, Groundwater Collection and Treatment, is appropriate for addressing contaminated groundwater. Alternatives S4 and G5 satisfy the requirements of CERCLA §121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9). The major components of the selected response measures include:

- excavation of approximately 28,000 cubic yards of highly contaminated soil from the arsenic and VOC source areas;
- capping of the residual soil contamination that still poses a direct contact threat;
- off-site transportation and disposal of contaminated soil and debris, with treatment of all RCRA-hazardous wastes prior to land disposal, as necessary;
- backfilling and grading of all excavated areas with clean fill;

- installation of groundwater extraction wells to extract and pre-treat the contaminated groundwater, as necessary, prior to discharge to the local POTW;

- implementation of a long-term groundwater sampling and analysis program to assess migration and possible attenuation of the groundwater contamination over time; and,

- institutional controls, such as a deed notice, to prevent exposure to residual soils that may exceed levels that would allow for unrestricted use, and a Classification Exception Area, to restrict the installation of wells and the use of groundwater in the area of groundwater contamination.

The Selected Remedy will achieve soil cleanup goals via removal of the contaminated Source Areas and a portion of the contaminated groundwater in addition to the extraction and treatment of contaminated groundwater. The selected Soil Alternative will achieve the Direct Contact Cleanup Goals that are protective for commercial/industrial land use within a reasonable time frame, removes the source of groundwater contamination, and provides for long-term reliability of the remedy. The selected Groundwater Remedy will contain and treat the arsenic and VOC plumes and eventually restore the groundwater to the Cleanup Goals, which are MCLs and groundwater quality standards. A groundwater monitoring program will also be implemented to evaluate the performance of the remedy over time, and to be used to optimize pumping operations. Institutional controls, such as a deed notice and Classification Exception Area, would be required to protect public health until the groundwater cleanup goals can be achieved.

EPA expects implementation of this remedy to be phased, with the soil alternative portion of the remedy initiated first. The pumping rates and size of the groundwater treatment system would then be designed to address the contamination remaining in groundwater after the soil removal effort. During the groundwater remedial design and remedial action, periodic rounds of groundwater monitoring will also be conducted to assess the effectiveness of the soil removal and expected natural attenuation at the site.

As discussed earlier in the Comparative Analysis of Alternatives section of this Decision Summary, there are a number of uncertainties with regard to the implementation of the Selected Remedy for groundwater, Alternative G5, though in general it appears to have fewer implementability concerns than Alternative G4 (geochemical fixation). Alternative G5 also actively

addresses the VOCs in groundwater, whereas Alternative G4 relies on MNA. As highlighted in comments received during the public comment period from a group of PRPs, some of the uncertainties related to Alternative G4 may be resolved through treatability studies. The sequence of remediation planned (soil remediation followed by groundwater remediation), will allow time to implement treatability studies for evaluating Alternative G4. In addition, after completion of the soil remedy the VOC groundwater conditions may be significantly improved, and MNA alone may address the residual VOC plume. Pending the results of the treatability studies, EPA may reconsider Alternative G4 either alone or in combination with Alternative G5.

The estimated costs of the Selected Remedy are $6,580,000 to address the contaminated soil and $6,600,000 to address the contaminated groundwater. Summaries of the estimated remedy costs for both the soil and groundwater Selected Remedies are included as Appendix II, Tables 8 and 9 of this ROD. The cost estimates are based on the best available information regarding the anticipated scope of the overall remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD amendment. These are an order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project costs.

Based on the information available at this time, EPA and the State of New Jersey believe the selection of the Selected Remedy provides the best balance of trade-offs among the response measures with respect to the nine evaluation criteria. EPA believes that the Selected Remedy will be protective of human health and the environment, will comply with ARARs, will be cost-effective, and will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA §121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d) further

specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4).

Protection of Human Health and the Environment

The Selected Remedy, Soil Alternative S4 coupled with Groundwater Alternative G5, will be protective of human health and the environment through the removal of contaminated soils from the site that are a contact hazard and a source of groundwater contamination. In addition, the Selected Remedy will implement extraction and treatment of contaminated groundwater, off-site discharge of treated water and institutional controls. Groundwater monitoring will further ensure that contaminated groundwater will not impact human health and the environment. The Selected Remedy will, over time, eliminate all significant risks to human health and the environment associated with the contaminated soil and groundwater. In addition, this action will eliminate and/or reduce substantial sources of contamination to the groundwater. This action will result in the reduction of exposure levels to acceptable risk levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens and below an HI of 1 for non-carcinogens. Implementation of the Selected Remedy will not pose unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

The Selected Remedy for both soil and groundwater will comply with ARARs. There are no chemical-specific ARARs for the contaminated soil. The Cleanup Goals are risk-based for the surface soils, and are similar to NJDEP's non-residential direct contact soil criteria. In addition, NJDEP has developed Impact to Groundwater Soil Cleanup Criteria to address sources of groundwater contamination in deeper soils, and EPA considered these criteria in developing the VOC Source Area Cleanup Goals for this site.

Transportation and disposal of any solid and hazardous wastes will be performed in accordance with regulations specified by the U.S. Department of Transportation 49 CFR 170-179, RCRA (40 CFR 258, 263, 264, and 265) and New Jersey (N.J.A.C. 7:26G, N.J.A.C. 16:49)

Soil testing may identify soils that exhibit hazardous characteristics, and if excavated, these soils will be treated to meet RCRA Land Disposal Restrictions prior to disposal in a RCRA compliant unit. Hazardous waste identification and listing will

be performed in accordance with 40 CFR 261 and N.J.A.C. 7:25G-5. Hazardous waste disposal will be performed in accordance with 40 CFR 268.45 and N.J.A.C. 7:26G-11.

There are no wetlands on site and, therefore, no wetlands-related ARARs.

The Selected Remedy for groundwater has been developed to meet Federal and State ARARs for drinking water. Pursuant to the New Jersey Ground Water Quality Standards, N.J.A.C. 7:9-6 et seq., the groundwater at the site is classified as IIA, which means it is a current or potential source of drinking water. The more restrictive of Federal or New Jersey MCLs will be used as the cleanup levels for groundwater. The treated water will meet the State of New Jersey's permit requirements to discharge to the CCMUA. Because there are no promulgated Federal or State Cleanup Standards for soil contamination, EPA established Cleanup Goals based upon the baseline risk assessment.

A complete list of ARARs can be found in Appendix II, Table 10 of this document.

Cost Effectiveness

In the lead agency's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430(f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of these remedial alternatives were determined to be proportional to costs and hence, these alternatives represent a reasonable value for the money to be spent.

The total present worth for the Selected Remedy is estimated to be $13,180,000, which addresses both soil and groundwater contamination. Separately, the total present worth for the soil portion of the Selected Remedy is estimated at $6,580,000 and the total present worth for the groundwater portion of the Selected Remedy is estimated at $6,600,000.

The Selected Remedy is cost effective as it has been determined to provide the greatest overall protectiveness for its present worth costs.

Utilization of Permanent Solutions and Alternative Treatment Technologies

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs to the extent practicable, EPA has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, the bias against off-site treatment and disposal, and State and community acceptance.

The Selected Remedy will provide adequate long-term control of risks to human health and the environment through excavation and off-site disposal of Source Area soils, capping of remaining residual contaminated soils, and through groundwater collection, on-site pretreatment and discharge to the local POTW, along with institutional controls. The Selected Remedy does not present short-term risks different from the other alternatives. There are no special implementability issues since the Selected Remedy employs standard technologies.

Preference for Treatment as a Principal Element

The Selected Remedy excavates and treats the most highly contaminated soil and, therefore, addresses the principal threat wastes at the site.

Five-Year Review Requirements

This remedy will result in hazardous substances, pollutants, or contaminants remaining on the Martin Aaron site above levels that may allow for unlimited use and unrestricted exposure. Pursuant to Section 121(c) of CERCLA,, a statutory review will be conducted within five years of the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Martin Aaron site was released for public comment on July 15, 2005. An extension was requested by interested parties, the public and the PRPs of record. On August 15, 2005, EPA granted an extension of the comment period. The comment period closed on September 14, 2005.

The Proposed Plan identified Alternative S4 (Excavation and Off-site Transportation of Source Areas with Treatment as necessary prior to Land Disposal, Capping Residual Soils) for contaminated soil and Alternative G5 (Groundwater Collection and Treatment) for contaminated groundwater as EPA's selected alternatives. EPA reviewed all written and verbal comments submitted during the public comment period. The comments received are documented in the Responsiveness Summary. EPA made one significant change to the remedy, as originally identified in the Proposed Plan, allowing for treatability studies to further evaluate Alternative G4 (geochemical fixation). Pending the outcome of treatability studies, Alternative G4 could be implemented alone or in combination with the Selected Remedy for groundwater. No other significant changes to the remedy were necessary or appropriate.

APPENDIX I
FIGURES

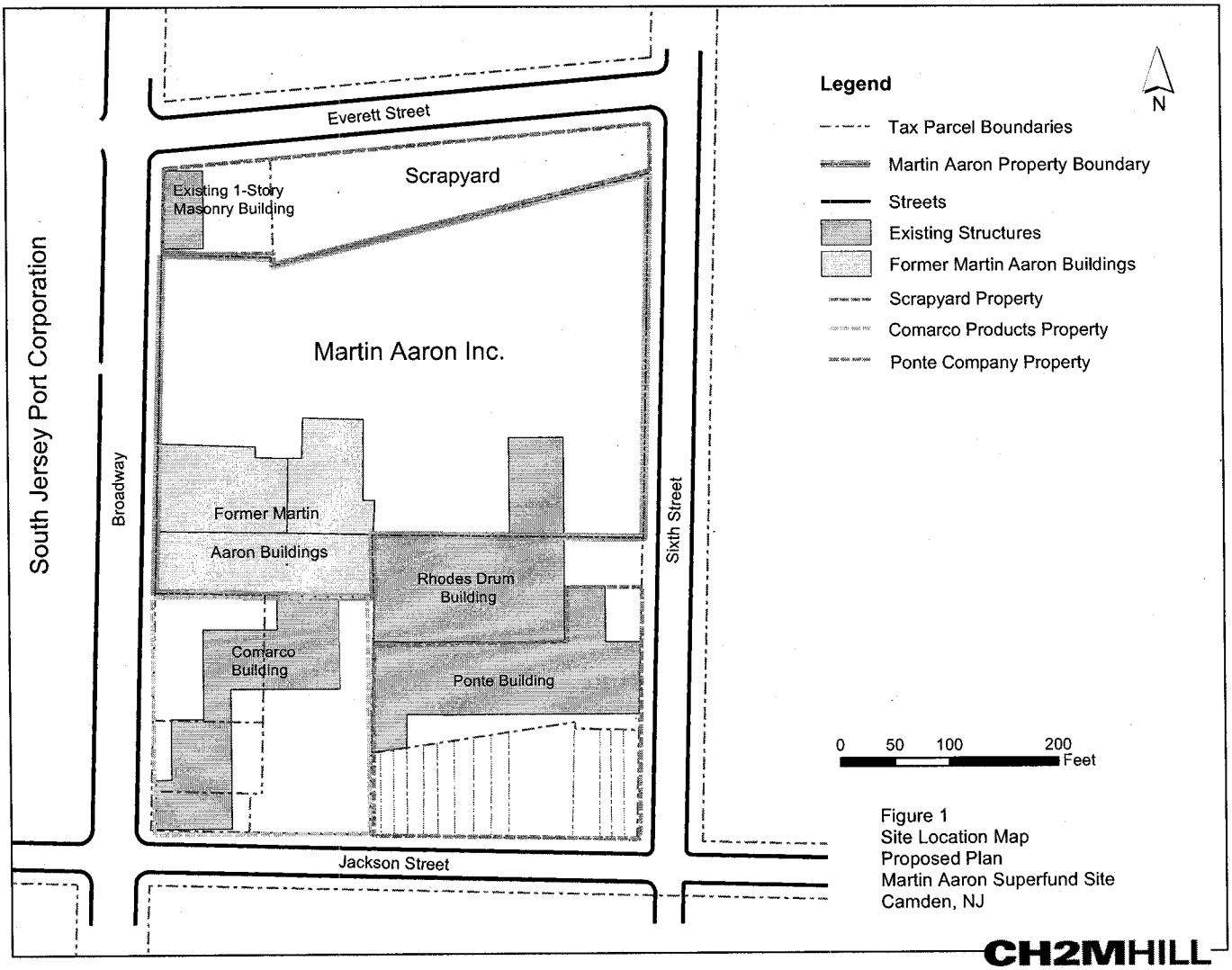

Figure 1
Site Location Map
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

CH2MHILL

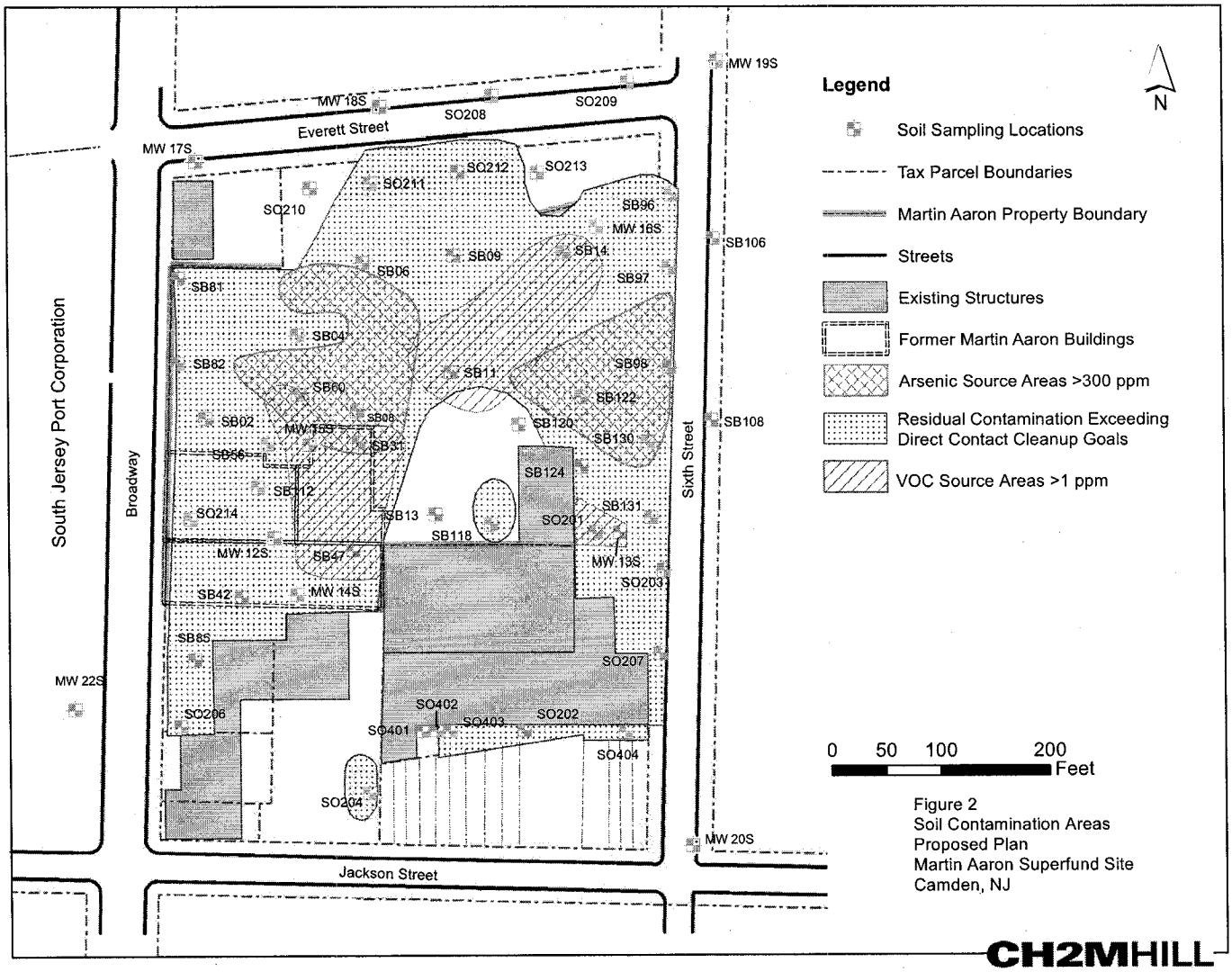

Figure 2
Soil Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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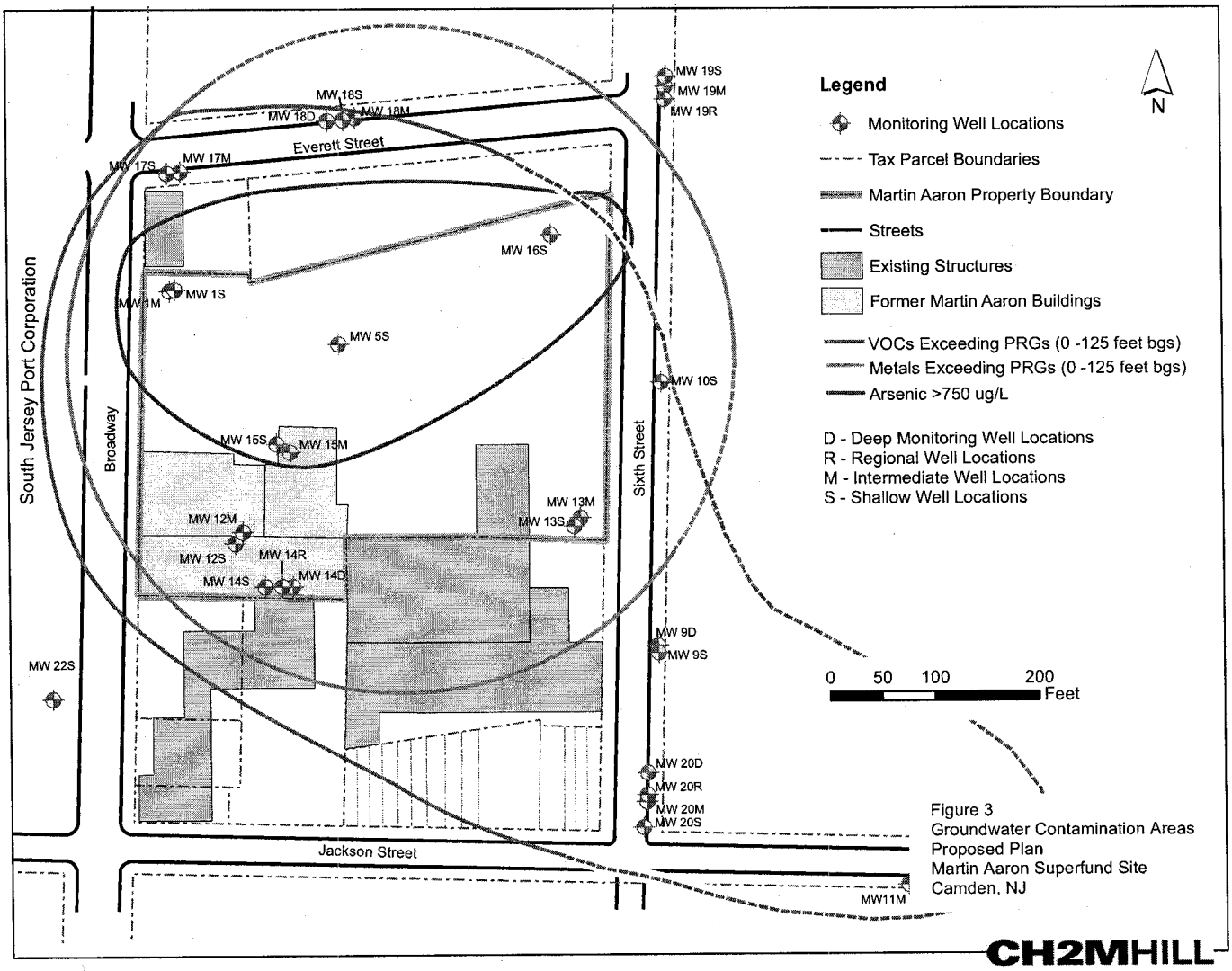

Figure 3
Groundwater Contamination Areas
Proposed Plan
Martin Aaron Superfund Site
Camden, NJ

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APPENDIX II
TABLES

APPENDIX II, TABLE 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Martin Aaron Property	Arsenic	2.1	766	mg/kg	24/24	286	mg/kg	95% UCL C
	Benzo[a]pyrene	0.04	110	mg/kg	23/24	62.3	mg/kg	99% UCL C

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Martin Aaron Property	Arsenic	2.1	2330	mg/kg	62/62	734	mg/kg	95% UCL T
	Benzo[a]pyrene	0.02	110	mg/kg	56/62	18	mg/kg	95% UCT C

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Scrap yard Area	Arsenic	17	27.7	mg/kg	2/2	27.7	mg/kg	Max

Scenario Timeframe: Current/Future
Medium: Surbsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Scrap yard Area	Arsenic	5.1	1240	mg/kg	8/8	1240	mg/kg	Max

APPENDIX II, TABLE 1

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Properties Adjacent to the Martin Aaron Property	Arsenic	3.2	339	mg/kg	5/5	339	mg/kg	Max

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Properties Adjacent to the Martin Aaron Property	Arsenic	1.5	365	mg/kg	15/15	365	mg/kg	Max

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater - Upper PRM Aquifer	Arsenic	1.6	7130	ug/l	25/28	3620	ug/l	99% UCL C
	Vinyl Chloride	0.55	58	ug/l	25/51	14.1	ug/l	97.5% UCL C

APPENDIX II, TABLE 1

Page 3 of 3

Summary of Chemicals of Potential Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Groundwater - Middle PRM Aquifer	Arsenic	1.6	7130	ug/l	25/28	3620	ug/l	99% UCL C
	Vinyl Chloride	0.55	58	ug/l	25/51	14.1	ug/l	97.5% UCL C

Key
mg/kg: milligrams per kilogram
ug/l: micrograms per liter
Max: Maximum detected concentration
95% UCL T: 95% Upper Confidence Limit of Log Transformed Data
95% UCL C: 95% Chebyshev Upper Confidence Limit
97.5% UCL C: 97.5% Chebyshev Upper Confidence Limit
99% UCL C: 99% Chebyshev Upper Confidence Limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The table presents the chemicals of potential concern (COPCs) and exposure point concentration for each of the COPCs detected in media at theMartin Aaron Superfund site (*i.e.*, the concentration that will be used to estimate the exposure and risk from each COPC in each medium). Arsenic and benzo[a]pyrene are the COPCs in the surface and subsurface soils at the Martin Aaron property, while arsenic is the only COPC in the surface and subsurface soils in the scrap yard area and in the properties adjacent to the site. Arsenic and vinyl chloride are the COPCs in the groundwater. The table includes the range of concentrations detected for each COPC in each medium, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was derived.

APPENDIX II, TABLE 2

Non-Cancer Toxicity Data Summary

-Ingestion

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Adjusted RfD (for Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Uncer-tainty /Modify Factors	Sources of RfD: Target Organ	Dates of RfD:
Arsenic	Chronic	3E-04	mg/kg-day	3E-04	mg/kg-day	Skin/ Circulatory	3/1	IRIS	01/03
Benzo[a]pyrene	NA	NA		NA		NA	NA	NA	NA
Vinyl Chloride	Chronic	3E-03	mg/kg-day	3E-03	mg/kg-day	Liver	30/1	IRIS	03/04

-Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhal. RfC	Inhal. RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Uncer-tainty /Modify Factors	Sources of RfD: Target Organ	Dates of RfC:
Arsenic	NA	NA		NA		NA	NA	NA	NA
Benzo[a]pyrene	NA	NA		NA		NA	NA	NA	NA
Vinyl Chloride	Chronic	1.0E-03	mg/m^3	2.9E-03	mg/kg-day	Liver	30/1	IRIS	03/04

Key
NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to arsenic, benzo[a]pyrene, and vinyl chloride, the contaminants of potential concern in both groundwater and surface and subsurface soils.

APPENDIX II, TABLE 3

Cancer Toxicity Data Summary

-Ingestion, Dermal Contact

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	1.5	$(mg/kg\text{-}day)^{-1}$	1.5	$(mg/kg\text{-}day)^{-1}$	A	IRIS	03/04
Benzo[a]pyrene	7.3	$(mg/kg\text{-}day)^{-1}$	7.3	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/03
Vinyl Chloride (adult)	1.5	$(mg/kg\text{-}day)^{-1}$	1.5	$(mg/kg\text{-}day)^{-1}$	A	IRIS	03/04

-Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	4.3E-03	$(mg/cu.\ m)^{-1}$	15	$(mg/kg\text{-}day)^{-1}$	A	IRIS	03/04
Benzo[a]pyrene	NA	$(mg/cu.\ m)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	B2	NA	NA
Vinyl Chloride (adult)	4.4E-06	$(mg/cu.\ m)^{-1}$	1.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	03/04

Key

IRIS: Integrated Risk Information System, U.S. EPA
NA: No information availabl

EPA Group:

A - Human carcinogen
B1 - Probable Human Carcinogen - Indicates that limited human data are available
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to arsenic, benzo[a]pyrene, and vinyl chloride, the contaminants of potential concern in both groundwater and surface and subsurface soils.

APPENDIX II, TABLE 4

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	Skin	086	–	0.24	1.1
							Total Hazard Index =	3.9

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	Skin	0.93	–	0.18	1.1
							Total Hazard Index =	3.7

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	Skin	2.4	–	0.47	2.9
							Total Hazard Index =	8.2

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Scrap yard Area	Arsenic	Skin	4.0	–	0.8	4.8
							Total Hazard Index =	5.6

APPENDIX II, TABLE 4

Page 2 of 2

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	Skin	1.1	–	0.22	1.3
							Total Hazard Index =	2.7

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	Skin	1.2	–	0.24	1.4
							Total Hazard Index =	2.9

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Upper PRM Aquifer	Arsenic	Skin	120	–	0.53	120
							Total Hazard Index =	130

Summary of Risk Characterization for Non-Carcinogens

The noncancer risk estimates presented represent both the noncarcinogenic hazards associated with exposure to the contaminants of potential concern as well as the total noncancer hazard index from exposure to all site-related contaminants detected. As shown in the table, the most significant contribution to the total noncancer hazard is from arsenic; no other individual contaminant contributed significantly to the total noncancer hazard.

APPENDIX II, TABLE 5

Page 1 of 3

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	5.0E-05	–	1.4E-05	6.4E-05
			Benzo[a]pyrene	5.3E-05	–	6.3E-05	1.2E-04
						Total Risk =	2.3E-04

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	1.5E-04	–	3.0E-05	1.8E-04
			Benzo[a]pyrene	1.6E-04	–	1.4E-04	3.0E-04
						Total Risk =	6.0E-04

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Martin Aaron Property	Arsenic	1.4E-05	–	8.5E-07	1.5E-05
			Benzo[a]pyrene	1.5E-05	–	3.9E-06	1.9E-05
						Total Risk =	3.8E-05

APPENDIX II, TABLE 5

Page 2 of 3

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	3.8E-04	–	7.6E-05	4.6E-04
			Benzo[a]pyrene	4.6E-05	–	3.9E-05	8.5E-05
						Total Risk =	6.3E-04

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Martin Aaron Property	Arsenic	3.7E-05	–	2.2E-05	3.9E-05
			Benzo[a]pyrene	4.4E-06	–	1.1E-06	5.5E-06
						Total Risk =	4.6E-05

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Scrap yard Area	Arsenic	1.5E-05	–	2.9E-06	1.7E-05
						Total Risk =	2.5E-05

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Scrap yard Area	Arsenic	6.5E-04	–	1.3E-04	7.8E-04
						Total Risk =	7.9E-04

APPENDIX II, TABLE 5

Page 3 of 3

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	1.8E-04	–	3.5E-05	2.1E-04
						Total Risk =	3.3E-04

Scenario Timeframe: Current/Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Properties Adjacent to the Martin Aaron Property	Arsenic	1.9E-04	--	3.8E-05	2.3E-04
						Total Risk =	3.5E-04

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Upper PRM Aquifer	Arsenic	1.9E-02	–	8.5E-05	1.9E-02
			Vinyl chloride	7.4E-05	–	5.0E-06	7.9E-05
						Total Risk =	1.9E-02

Summary of Risk Characterization for Carcinogens

The cancer risk estimates presented represent both the cancer risk associated with exposure to the contaminants of potential concern as well as the total cancer risk from exposure to all site-related contaminants detected. As shown in the table, the most significant contribution to the total cancer risk is from arsenic, benzo[a]pyrene, and vinyl chloide; no other individual contaminant contributed significantly to the total cancer risk.

APPENDIX II, TABLE 6
Cleanup Goals for Soil
Martin Aaron Site

Chemical	Direct-Contact Cleanup Goals (Commercial/Industrial)	Source Area Cleanup Goals
Metals		
Arsenic	20	300
VOCs		
Benzene	1.4	1
Bis(2-chloroethyl)ether	0.58	
Chloroform	0.47	1
Tetrachloroethylene	1.3	1
Trichloroethylene	0.11	1
Vinyl Chloride	0.75	10
SVOCs		
Benzo[a]anthracene	2.1	
Benzo[a]pyrene	0.21	
Benzo[b]fluoranthene	2.1	
Benzo[k]fluoranthene	21	
Dibenzo[ah]anthracene	0.21	
Indeno[123-cd]pyrene	2.1	
Pesticides		
Aldrin	0.10	
Dieldrin	0.11	
PCB - Aroclor 1254	10	
PCB - Aroclor 1260	10	

Notes:
1. All goals expressed as parts per million (ppm).

APPENDIX II, TABLE 7
Cleanup Goals for Groundwater
Martin Aaron Site

Chemical	EPA MCL	NJ MCL	NJ GWQS
Metals			
Arsenic	10	50	8
VOCs			
Benzene	5	1	1
Bis(2-chloroethyl)ether	NA	NA	10
Tetrachloroethylene	5	1	1
Trichloroethylene	5	1	1
Vinyl Chloride	2	2	5
Pesticides			
Dieldrin	NA	NA	0.03

1. The lowest values of the promulgated cleanup goals shown above, shall be used.
2. All goals expressed as parts per billion (ppb).

APPENDIX II
TABLE 8

Alternative: **Cap, Excavation, Treatment and Offsite Disposal** **COST ESTIMATE SUMMARY**

Site: Martin Aaron Superfund Site, Camden, N. J.
Location: Soil Media
Phase: Feasibility Study
Base Year: 2005
Date: 11/2/2005 16:10

Description: Excavation of Arsenic >300 ppm in soil with offsite disposal. Ex situ stabilization of 50% and disposal at Subtitle D Landfill. Remaining 50% of arsenic soil disposed without stabilization at Subtitle D Landfill. Excavation of VOC impacted soils > 10^-4 ELCR, stabilization assumed not needed, and disposed at Subtitle D Landfill. Excavated areas backfilled with clean certified material and and asphalt cap constructed over preceeding area and area with VOCs, SVOCs, Pesticides, PBCs and Metals exceeding 10^-6 ELCR, HI=1 or PRGs and excavated areas as w Institutional controls include deed notices describing the soil contamination and restrictions on site use and soil excavation.

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Institutional Controls	1	LS	$15,000	$15,000	Source 1
Predesign Investigations					
Investigation	1	LS	$50,000	$50,000	CH2M Est.
SUBTOTAL				$50,000	
Asphalt Cap Area					
Silt Fencing (MA Property)	2,100	FT	$3.36	$7,050	MEANS 18 05 0206
Clear and Grub (MA Property)	3.9	AC	$8,066	$31,729	MEANS 17 01 0106
Rough Grading (MA Property)	21,404	SY	$5.15	$110,134	MEANS 17 03 0101
Fine Grading (MA Property)	21,404	SY	$1.42	$30,429	MEANS 17 03 0103
Gravel Base, 4 inches (MA Property)	2,677	CY	$35	$92,467	MEANS 18-01-0102
Asphalt Cap 4" Base Course (MA Property)	3.9	AC	$130,000	$511,399	Matcon Quote
SUBTOTAL				$783,227	
Mobilization/Demobilization	5%			$39,161	Per CCI
Subcontractor General Conditions	15%			$40,774	Per CCI, Matcon costs only.
SUBTOTAL				$863,163	
Excavation					
Soil Excavation and Truck Loading	34,494	CY	$5.54	$191,140	MEANS 17-03-0276
Subtitle C Landfill Transport, Treatment and Disposal	10,352	CY	$114	$1,180,111	Model City Quote
Subtitle D Landfill Transport and Disposal	24,142	CY	$30	$724,273	Model City Quote
Clean Backfill	34,494	CY	$20	$689,886	Compacted, per CCI
Full TCLP Analysis	43	EA	$500	$21,559	1 samp/ 800 CY, Analytical Services Center Quote
SUBTOTAL				$2,806,969	
Mobilization/Demobilization	5%			$140,348	Per CCI
Subcontractor General Conditions	15%			$135,388	Per CCI, Less Disposal Costs.
SUBTOTAL				$3,082,705	
Soil Verification Sampling					
Soil Samples	1	LS	$50,000	$50,000	Project Exper
SUBTOTAL				$50,000	
Building Demolition					
Demolish Masonary Foundation Wall	3,778	CF	$4.43	$16,736	
Demolish Floor and Foundation	14,183	CF	$7.92	$112,263	MEANS 16-01-0102
Demolish Roof	21,274	SF	$0.44	$9,359	
Asbestos, Lead and PCB Survey	1	LS	$10,000.00	$10,000	
Subtitle D Landfill Disposal	1,129	CY	$30	$33,874	Model City Quote
SUBTOTAL				$182,232	
Mobilization/Demobilization	5%			$9,112	Per CCI
Subcontractor General Conditions	15%			$27,335	Per CCI
SUBTOTAL				$218,679	
SUBTOTAL				$4,280,000	
Contingency	25%			$1,070,000	10% Scope + 15% Bid
SUBTOTAL				$5,350,000	
Project Management	**5%**			$267,500	**USEPA 2000, p. 5-13, $2M-$10M**
Remedial Design	**8%**			$428,000	**USEPA 2000, p. 5-13, $2M-$10M**
Construction Management	**6%**			$321,000	**USEPA 2000, p. 5-13, $2M-$10M**
SUBTOTAL				$1,016,500	
TOTAL CAPITAL COST				**$6,400,000**	

APPENDIX II
TABLE 8

Alternative: **Cap, Excavation, Treatment and Offsite Disposal** **COST ESTIMATE SUMMARY**

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Cap Semi-annual Inspection	4	Hr	$60	$240	
Cap Repair	1	LS	$5,114	$5,114	Assumes 1% of area requires repair annually
Cap Inspection and Repair Report	1	LS	$500	$500	Biennial Report to NJDEP
SUBTOTAL				$5,854	
Contingency	30%			$1,756	10% Scope + 20% Bid
SUBTOTAL				$7,610	
Project Management	5%			$381	
Technical Support	10%			$761	
TOTAL ANNUAL O&M COST				**$8,800**	

PERIODIC COSTS

DESCRIPTION	YEAR	QTY	UNIT	UNIT COST	TOTAL	NOTES
5 year Review	5	1	LS	$15,000	$15,000	
5 year Review	10	1	LS	$15,000	$15,000	
5 year Review	15	1	LS	$15,000	$15,000	
5 year Review	20	1	LS	$15,000	$15,000	
5 year Review	25	1	LS	$15,000	$15,000	
Asphalt Cap Replacement	30	1	LS	$168,420	$168,420	Assume 30% of 4" cap replaced
5 year Review	35	1	LS	$15,000	$15,000	
5 year Review	40	1	LS	$15,000	$15,000	
5 year Review	40	1	LS	$15,000	$15,000	
5 year Review	45	1	LS	$15,000	$15,000	
5 year Review	50	1	LS	$15,000	$15,000	
			Total		$320,000	
TOTAL ANNUAL PERIODIC COST					**$320,000**	

PRESENT VALUE ANALYSIS

Discount Rate = 7.0%

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE	NOTES
CAPITAL COST	0	$6,400,000	$6,400,000	1.000	$6,400,000	
ANNUAL O&M COST	1 to 50	$440,000	$8,800	13.801	$121,447	
PERIODIC COST	5	$15,000	$15,000	0.71	$10,695	
PERIODIC COST	10	$15,000	$15,000	0.51	$7,625	
PERIODIC COST	15	$15,000	$15,000	0.36	$5,437	
PERIODIC COST	20	$15,000	$15,000	0.26	$3,876	
PERIODIC COST	25	$15,000	$15,000	0.18	$2,764	
PERIODIC COST	30	$168,420	$168,420	0.13	$22,125	
PERIODIC COST	35	$15,000	$15,000	0.09	$1,405	
PERIODIC COST	40	$30,000	$30,000	0.07	$2,003	
PERIODIC COST	45	$15,000	$15,000	0.05	$714	
PERIODIC COST	50	$15,000	$15,000	0.03	$509	
		$7,200,000			$6,576,600	
TOTAL PRESENT VALUE OF ALTERNATIVE					**$6,580,000**	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000).

APPENDIX II
TABLE 9

Alternative: **Groundwater Collection and Treatment** **COST ESTIMATE SUMMARY**

Site: Martin Aaron Superfund Site, Camden, N. J.
Media: Groundwater
Phase: Feasibility Study
Base Year: 2005
Date: 11/2/2005 16:30

Description: Institutional controls include Classification Exception Area. Groundwater extraction collection with 13 EWs and treatment using a chemical precipitation process with discharge of treated effluent to the Camden POTW.

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Institutional Controls (Groundwater Use Restrictions)	1	LS	$15,000	$15,000	Source 1
Predesign Investigations					
Install 5 additional monitoring wells	5	LS	$1,785	$8,925	CH2M Est.
Bench Scale Precipitation Testing	1	LS	$25,000	$25,000	
Pilot Scale Test	1	LS	$100,000	$100,000	
SUBTOTAL				$133,925	
EW Installation					
Mobilization/Demobilization	1	LS	$25,000	$25,000	Includes submittals;
Soil Borings	650	FT	$47	$30,225	Miller Drilling Quote.
6-inch PVC Well Casing	390	FT	$25	$9,599	33-23-0103
6-inch PVC Well Screen	260	FT	$44	$11,548	33-23-0203
Trenching	3,000	LF	$30	$90,000	Project Exper- M.G.
Conveyance Piping	3,000	LF	$12	$36,000	Project Exper- M.G.
Pumps	13	EA	$3,000	$39,000	
SUBTOTAL				$241,373	
Treatment System					
Remediation Building w/ Electrical & HVAC	1	LS	$156,000	$156,000	MEANS SF Costs
Parkson Lamella Gravity Settler (LGS-300/55)	1	EA	$50,000	$50,000	
Parkson DynaSand Filter (DSF-19)	1	EA	$101,500	$101,500	Parkson Quote for Clarifier & Filter
3 CF Sludge Filter Press	1	EA	$13,500	$13,500	Parkson Quote
5,000 Gallon Tank (Oxidation Tank)	2	EA	$7,954	$15,908	33-10- 9660
Chemical Feeder (10 gph)	4	EA	$3,099	$12,396	33-12-9905
2,000 Gallon Tank (Coagulation Rxn Tank)	1	EA	$4,714	$4,714	33-10-9658
3000 Gallon Tank (Filtrate Storage Tank)	1	EA	$6,160	$6,160	33-10-9659
8,000 Gallon Tank (Sludge Storage Tank)	1	EA	$12,605	$12,605	33-10-9661
Mixer	3	EA	$4,362	$13,087	33-13-0428
Transfer Pump - 100 gpm	1	EA	$6,211	$6,211	33-23-0561
Transfer Pump - 35 gpm	2	EA	$3,864	$7,728	33-23-0562
Transfer Pump - 10 gpm	3	EA	$1,322	$3,967	33-23-0563
Hydrogen Peroxide Feed System	1	EA	$3,820	$3,820	33-33-0172
Control System w/ Autodialer, Remote Telemetry	1	LS	$50,000	$50,000	CH2M Est.
Startup - Labor	240	HRS	$80	$19,200	CH2M Est. - 2 persons
Startup- Equipment	1	LS	$2,000	$2,000	CH2M Est.
Start-up- Consumables	1	LS	$1,000	$1,000	CH2M Est.
SUBTOTAL				$479,796	
Allowance for Misc. Items	20%			$95,959.11	

APPENDIX II
TABLE 9

Alternative: Groundwater Collection and Treatment — **COST ESTIMATE SUMMARY**

	Fittings, Valves, Miscellaneous Appertanances	5%	$23,989.78	
	Mobilization/Demobilization	5%	$23,989.78	
	Subcontractor General Conditions	15%	$71,969.33	
	SUBTOTAL		$695,704	
SUBTOTAL			$1,086,001	
	Contingency	25%	$271,500	10% Scope + 15% Bid
	SUBTOTAL		$1,357,501	
	Project Management	6%	$81,450	USEPA 2000, p. 5-13, $500K-$2M
	Remedial Design	12%	$162,900	USEPA 2000, p. 5-13, $500K-$2M
	Construction Management	8%	$108,600	USEPA 2000, p. 5-13, $500K-$2M
	SUBTOTAL		$352,950	
	TOTAL CAPITAL COST		**$1,700,000**	

OPERATIONS AND MAINTENANCE COST

DESCRIPTION	YEAR	QTY	UNIT	COST	TOTAL	NOTES
GW MNA Sampling						
Groundwater Samples		21	LS	$360	$7,560	Vocs, metals, MNA analysis
QC Samples		6	LS	$360	$2,160	Vocs and metals analysis
Groundwater Sampling, Level D						
Labor		48	HRS	$80	$3,840	CH2M Est. - 2 persons
Equipment - meters		1	LS	$500	$500	CH2M Est.
Consumables		1	LS	$200	$200	CH2M Est.
Data Validation		13.5	HRS	$80	$1,080	CH2M Est.
Reporting		16	HRS	$80	$1,280	CH2M Est.
SUBTOTAL					$16,620	
Allowance for Misc. Items		20%			$3,324	
SUBTOTAL					$19,944	
Contingency		30%			$5,983	10% Scope + 20% Bid
SUBTOTAL					$25,927	
Treatment System						
Chemical Usage		1	LS	$60,000	$60,000	CH2M Est.
Cement for Solidification of Sludge		2	CY	$20	$40	CH2M Est.
Transport and Disposal of Solidified Sludge		10	CY	$100	$1,000	CH2M Est.
Routine Operations, Maintenance, Monitoring		2080	Hr	$80	$166,400	CH2M Est.
EW Monitoring Laboratory Analysis		168	EA	$360	$60,480	33-02-0508
Treatment System Laboratory Analysis		60	EA	$360	$21,600	VOC and metals analysis
Data Validation, Database Management		114	Hr	$80	$9,120	CH2M Est.
O&M Project Management		1	LS	$38,640	$38,640	15% of Sampling and Data Mgmt.
Electricity		12	Months	$200	$2,400	CH2M Est.
Reporting		1	LS	$20,000	$20,000	CH2M Est.
POTW User Fee Initial 4,000 CF		4,000	CF	0.019	$76	0 to 4000 CF (Camden Water, LLC Quote)
POTW User Fee FLOW > 4,000 CF		5,968,727	CF	0.023	$134,296	> 4000 CF (Camden Water, LLC Quote)

APPENDIX II
TABLE 9

Alternative: Groundwater Collection and Treatment — **COST ESTIMATE SUMMARY**

Electricity For EW Pumps		42,477	KWH	$0.08	$3,300	MEANS 33-42-0101
SUBTOTAL					$517,353	10% Scope + 20% Bid
Contingency		30%			$155,206	
SUBTOTAL					$672,559	
TOTAL ANNUAL O&M COST					**$700,000**	

PERIODIC COSTS

DESCRIPTION		QTY	UNIT	UNIT COST	TOTAL	NOTES
5 year Review	5	1	LS	$15,000	$15,000	
5 year Review	10	1	LS	$15,000	$15,000	
SUBTOTAL					$30,000	
TOTAL ANNUAL PERIODIC COST					**$30,000**	

PRESENT VALUE ANALYSIS

Discount Rate = 7.0%

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE	NOTES
CAPITAL COST	0	$1,700,000	$1,700,000	1.000	$1,700,000	
ANNUAL O&M COST	1 to 10	$7,000,000	$700,000	7.02	$4,916,507	
PERIODIC COST	5	$15,000	$15,000	0.71	$10,695	
PERIODIC COST	10	$15,000	$15,000	0.51	$7,625	
		$8,730,000			$6,634,827	
TOTAL PRESENT VALUE OF ALTERNATIVE					**$6,600,000**	

SOURCE INFORMATION

1. United States Environmental Protection Agency. July 2000. A Guide to Preparing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002. (USEPA, 2000).

APPENDIX II
TABLE 10
Potential Chemical-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Federal Safe Drinking Water Act	National Primary Drinking Water Standards - Maximum Contaminant Level Goals (MCLGs)	40 CFR 141	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety.	The MCLs have been applied to the remediation of groundwater.
Federal Safe Drinking Water Act	National Secondary Drinking Water Standards-Secondary MCLs	40 CFR 143	Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.	
Federal Resource Conservation and Recovery Act	Groundwater Protection Standards and Maximum Concentration Limits	40 CFR 264, Subpart F	Establishes standards for groundwater protection.	
State of New Jersey Statutes and Rules	Drinking Water Standards-Maximum Contaminant Levels (MCLs)	N.J.A.C. 7:10 Safe Drinking Water Act	Establishes MCLs that are generally equal to or more stringent the SDWA MCLs.	Although there are no local receptors and all properties are served by city water, the underlying aquifer is a drinking water supply source.
State of New Jersey Statutes and Rules	National Secondary Drinking Water Standards-Secondary MCLs	N.J.A.C. 7:10-7 Safe Drinking Water Act	Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.	
State of New Jersey Statutes and Rules	Groundwater Quality Standards	N.J.A.C. 7:9-6 Groundwater Quality Standards	Establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups.	

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Safe Drinking Water Act (SDWA)	40 USC 300 et seq.		
National Primary Drinking Water Standards	40 CFR 14P	Establishes health-based standards for public water systems (maximum contaminant levels [MCLs]).	MCLs are ARARs in cases where affected groundwater is or may be used directly for drinking water.
National Secondary Drinking Water Standards	40 CFR 143	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels [SMCLs]).	
Maximum Contaminant Level Goals	PL 99-339, 100 Stat. 642 (1986)	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	
Clean Water Act (CWA)	33 USC 1251 et seq.		
Water Quality Criteria	40 CFR 131 Quality Criteria for Water, 1976, 1980, and 1986	Sets criteria for water quality based on toxicity to human health.	If water is discharged to surface water.
Ambient Water Quality Criteria	40 CFR 131	Sets criteria for ambient water quality based on toxicity to aquatic organisms.	If water is discharged to surface water.
Toxic Pollutant Effluent Standards	40 CFR 121	Establishes effluent standards or prohibitions for certain toxic pollutants; I.e., aldrin/dieldrin, DDT, DDD, DDE, endrin, toxaphene, benzideine, and PCBs	If water treatment and discharge will be required during remediation.
Resource Conservation and Recovery Act (RCRA)	42 USC 6901 et seq.		
Identification and Listing of Hazardous Wastes	40 CFR 261	Defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR 262-265, 270, and 271.	For identification of listed or characteristic RCRA wastes at a site.
Releases from Solid Waste Management Units (SWMUs)	40 CFR 264, Subpart F	Establishes maximum concentration levels for specific contaminants from a solid waste management unit (SWMU).	Probably not ARARs for state Superfund sites.
Land Disposal Restrictions (LDRs)	40 CFR 268	Establishes treatment standards for land disposal of hazardous wastes.	Applicable materials will be disposed of on land.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Clear Air Act (CAA)	42 USC 7401		
National Ambient Air Quality Standards	40 CFR 50	Establishes primary and secondary standards for six pollutants to protect the public health and welfare.	These are ARARs for remedial alternatives that would result in emissions of the specific pollutants during implementation.
National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 61	Establishes regulations for specific air pollutants such as asbestos, beryllium, mercury, vinyl chloride, and benzene.	Potentially not applicable to contaminants at this site.
New Performance Standards for Criteria and Designated Pollutants	40 CFR 60	Establishes new source performance standards (NSPSs) for certain classes of new stationary sources.	Potentially not applicable because the remediation will not involve a new source (e.g., an on-site incinerator) subject to NSPS.
New Jersey Statutes and Rules	New Jersey Administrative Code (N.J.A.C.); New Jersey Statutes Annotated (N.J.S.A)		
Drinking Water Standards - maximum contaminant levels (MCLs)	58 N.J.S.A. 12A-1	Establishes MCLs that are generally equal to or more stringent than SDWA MCLs.	Although there are no local receptors and all properties are served by city water, the underlying aquifer is a drinking water supply source.
Technical requirements for site remediation, and guidance document for the remediation of contaminated soils	N.J.A.C. 7:26E	Establishes minimum regulatory requirements for remediation of contaminated sites in New Jersey.	While a federal EPA lead, these requirements have been identified as applicable to the site.
National Historic Preservation Act	16 USC 469 et seq. 40 CFR 6301(c)	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	If historical or archaeological data could potentially be encountered during remediation.
Fish and Wildlife Coordination Act	16 USC 661-666	Requires consultation when federal department or agency proposes or authorizes any modification of any stream or other water body and adequate provision for protection of fish and wildlife resources.	Not an ARAR because the response actions will not affect surface water bodies.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Clean Water Act (CWA)	33 USC 1251-1376		
Dredge of Fill Requirements (Section 404)	40 CFR 230-231	Requires discharges to address impacts of discharge of dredge or fill material on the aquatic ecosystem.	Not an ARAR because the response actions will not involve discharge of dredge or fill into surface water body.
Executive Order on Flood Plain Management	Executive Order 11988	Requires federal agencies to evaluate the potential effects of actions they may take in a flood plain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a flood plain.	An ARAR if any portion of the site us within the 100-year flood plain.
New Jersey Flood Hazard Control Act	N.J.A.C. 7:13	State standards for activities within flood plains.	An ARAR for those aspects of the site work that are within the flood plain.
New Jersey Freshwater Protection Act	N.J.S.A. 13:9B-1; N.J.A.C 7:7A	Require permits for regulated activity disturbing wetlands.	Not an ARAR because no wetlands on site would be affected.
Endangered Species Act	16 USC 1531 et seq.; 40 CFR 400	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Endangered and Non-Game Species Act	N.J.S.A. 23:2A-1	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Fish and Wildlife Coordination Act	16 USC 661 et seq.	Requires conservation of fish and wildlife and their habitats.	Not and ARAR because this site does not contain fish and wildlife habitat.
New Jersey Uniform Construction Code	N.J.A.C. 5:23	Establishes standards for all new construction and renovation.	This may be an ARAR to the extent that new construction falls within the standards.
Clean Water Act (CWA)	33 USC 1251-1376		
National Pollutant Discharge Elimination System (NPDES)	40 CFR 125	Requires permit for the discharge of pollutants for any point source and stormwater runoff for specific Standard Industrial Codes (SICs) into waters of the United States.	Substantive requirements for a permit will be required for discharge to a surface water body if water generated during the remediation is discharged to surface water.
Effluent Guidelines and Standards for the Point Source Category	40 CFR 414	Requires specific effluent characteristics for discharge under NPDES permits.	Probably not applicable because there will be no ongoing commercial activity at a state Superfund site.
National Pretreatment Standards	40 CFR 403	Sets standards to control pollutants that pass through or interfere with treatment processes in public treatment works or that may contaminate sewage discharge.	Only if the selected alternative includes discharge of water to a POTW.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Resource Conservation and Recovery Act (RCRA)	42 USC 6901-6987		
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR 257	Establishes criteria for use in determining which solids waster disposal facilities and practices pose a reasonable probability of adverse effects on public health or the environment and thereby constitute prohibited open dumps.	Not an ARAR because on-site disposal is not an option at the site.
Standards Applicable to Generators of Hazardous Wastes	40 CFR 262	Establishes standards for generators of hazardous wastes.	An ARAR because response action involves soil or water that would be considered hazardous under RCRA.
Standards Applicable to Transporters of Hazardous Wastes	40 CFR 263	Establishes standards that apply to transporters of hazardous wastes within the United States if the transportation requires a manifest under 40 CFR 262.	An ARAR because action involves off-site transportation of soil or water that would be considered hazardous under RCRA.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs)	40 CFR 264	Establishes minimum national standards that define the acceptable management of hazardous wastes for owners and operators of facilities that treat, store, or dispose of hazardous wastes.	Part 264 requirements may be ARARs for certain remedial actions under CERCLA. See each subpart that follows.
General Facility Standards	Subpart B	Establishes minimum standards for treatment, storage, and disposal facilities (TSDFs).	May be an ARAR if any remedial actions are selected for which other subparts of 264 are relevant and appropriate.
Preparedness and Prevention	Subpart C	Establishes minimum standards for hazard management.	Not an ARAR because on-site storage or treatment will not be conducted.
Contingency Plan and Emergency Procedures	Subpart D	Establishes minimum standards for hazard management.	Not an ARAR because on-site storage or treatment will not be conducted.
Manifest System, Recordkeeping, and Reporting	Subpart F	Establishes standards for tracking waste during off-site transport.	An ARAR because response action will involve off-site transport of hazardous waste.
Releases from Solid Waste Management Units (SWMUs)	Subpart F	Establishes standards for control of SWMUs.	Not an ARAR because response action will not involve on-site disposal.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Closure and Post-Closure	Subpart G	Establishes standards for site closure.	CERCLA establishes review of remedial actions should contaminants be left on-site. Substantive requirements need to be met, including monitoring and deed notices.
Financial Requirements	Subpart H	Establishes administrative requirements for demonstrating fiscal responsibilities.	These are administrative requirements only.
Use and Management of Containers	Subpart I	Establishes standards for container storage.	May be ARARs if an alternative would involve storage of containers of hazardous wastes.
Tanks	Subpart J	Establish standards for tank storage and handling.	May be ARARs if an alternative would involve use of tanks to treat or store hazardous materials.
Surface Impoundments	Subpart K	Establishes standards for surface-impounded wastes.	Not an ARAR because alternatives would not involve a surface impoundment to treat, store, or dispose of hazardous materials.
Waste Piles	Subpart L	Established standards for managing wastes in piles.	Not an ARAR because alternatives would not treat or store hazardous materials in piles.
Land Treatment	Subpart M	Establishes standards for managing land treatment.	Not an ARAR because alternatives would not involve on-site treatment.
Landfills	Subpart N	Establishes standards for managing landfills.	May be ARAR if an alternative would involve disposal of hazardous materials in a landfill.
Incinerators	Subpart O	Establishes standards for incineration of wastes.	May be ARARs if an incinerator alternative is selected.
Interim Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 265	Establishes minimum national standards that define the acceptable management of hazardous wastes during the period of interim status and until certification of final closure or if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.	Remedies should be consistent with the more stringent Part 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	40 CFR 266	Establishes requirements that apply to recyclable materials that are reclaimed to recover economically significant amounts of precious metals.	Does not establish additional cleanup requirements.
Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 CFR 267	Establishes minimum standards that define acceptable management of hazardous wastes for new land disposal facilities.	Remedies should be consistent with the more stringent Part 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and the environment.
Land Disposal Restrictions	40 CFR 268	Identifies hazardous wastes that are restricted from land disposal and describes those circumstances under which an otherwise prohibited waste may be disposed of on land.	An ARAR because alternatives include land application of wastes.
Hazardous Waste Permit Program	40 CFR 270	Establishes provisions covering basic EPA permitting requirements.	A permit is not required for on-site CERCLA response actions. Substantive requirements are addressed in 40 CFR 264.
Underground Storage Tanks	40 CFR 280	Establishes regulations related to underground storage tanks (USTs).	No alternative involving the use of USTs is anticipated.
Resource Conservation and Recovery Act (RCRA) Rule Change	57 FR 37193	Addresses the LDRs for hazardous debris.	An RAR because debris is present.
Corrective Action Management Units (CAMUs) and Temporary Units (Tus)	40 CFR, Subpart S, Part 264	Enables availability of CAMUs to those who initiate corrective action and seek agency approval under RCRA.	Not an ARAR.
RCRA LDRs, Phase II	57 FR 27880, 30657, 37284, 47376, and 6149	Establishes a list of items considered industrial waste as a solid or hazardous waste.	Not applicable because there will be no ongoing commercial activity.
RCRA LDRs, Phase II	57 FR 12	EPA clarification that a waste is not presumptively hazardous merely because it contains as Appendix VIII hazardous waste constituent.	Applicable is ongoing commercial activity occurs.
RCRA LDRs, Phase II	57 FR 21524 as corrected by 57 FR 29220	Establishes management standards for recycled oils.	Not applicable because recycled oils are not present.

APPENDIX II
TABLE 10
Action Specific ARARs
Martin Aaron Superfund Site

Standard Requirements, Criteria, or Limitations	Citation	Description	Comments
RCRA	40 CFR 265	Establishes organic air emission standards for tanks, surface impoundments, and containers.	Applicable to hazardous waste treatment, storage, and disposal facilities (TSDFs) that receive new or re-issued permits or Class 3 modifications after 5 January 1995.
RCRA LDRs, Phase II	EPA, 976 F.2d 2, 17-18 (D.C. Cir 1992)	Establishes universal treatment standards and treatment standards for organic toxicity characteristic wastes and newly listed wastes.	May be applicable to listed or characteristically hazardous wastes for which a treatment standard has been promulgated, landfilling is planned, and the CAMU/TU regulations do not apply.
RCRA LDRs, Phase IV	40 CFR 268.30 and 268.40	Establishes specific land disposal prohibitions and treatment standards for wood-preserving wastes.	An ARAR because response actions will involve off-site treatment and disposal of F034 wastes.
Occupational Safety and Health Act (OSHA)	29 USC 651-578	Regulates worker health and safety.	Under 40 CFR 300.38, requirements of the act apply to all response activities under the NCP.
Safe Drinking Water Act (SDWA)	40 CFR 144-147		
Underground Injection Control Regulations	40 CFR 144-147	Provides for protection of underground sources of drinking water.	Not an ARAR because response action does not involve groundwater remediation.
Hazardous Materials Transportation Act (HMTA)	49 USC 1801-1813		
Hazardous Material Transportation Regulations	49 CFR 107, 171-177	Regulates transportation of hazardous materials.	An ARAR because response action would involve transportation of hazardous materials.
Clean Air Act (CAA)	42 USC 7401		
Permitting	40 CFR 61	Requires permits for the discharge of pollutants for point sources, area sources, or fugitive emissions.	Substantive requirements for a permit will be required for discharge from the evacuation enclosure.

APPENDIX II
TABLE 10
Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Discharge of Groundwater or Wastewater				
Federal Clean Water Act	National Pollution Discharge Elimination System (NPDES)	40 CFR 122 and 125	Issues permits for discharge into navigable waters. Establishes criteria and standards for imposing treatment requirements on permits.	Disposal of groundwater to the surface water. NPDES permit may not be required since New Jersey has an approved SPDES permit program (NJDPES).
Federal Clean Water Act	General Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403	Prohibits discharge of pollutants to a POTW which cause or may cause pass-through or interference with operations of the POTW.	Discharge ot pollutants including those that could cause fire or explosion or result in toxic vapors or fumes to POTW.
Federal Clean Water Act	Effluent Guidelines and Standards for the Point Source Category	40 CFR 414	Requires specific effluent characteristics for discharge under NPDES permits.	Disposal of groundwater to the surface water. NPDES permit may not be required since New Jersey has an approved SPDES permit program (NJDPES).
Federal Safe Drinking Water Act	Underground Injection Control Program	40 CFR 144	Establishes performance standards, well requirements, and permitting requirements for groundwater re-injection wells.	Discharge of treated groundwater to potable water supply aquifer. May also apply to the injection of surfaciants or oxidants into the aquifer.
Federal Clean Water Act	Ambient Water Quality Criteria	40 CFR 131.36	Establishes criteria for surface water quality based on toxicity to aquatic organisms and human health.	Groundwater discharge to surface water. Federally-approved New Jersey groundwater and surface water standards take precedence over the Federal criteria.
Federal Clean Water Act	Water Quality Criteria Summary		Includes non-promulagated guidance values for surface water based on toxicity to aquatic organisms and human health. Issued by th EPA office of Science and Technology, Health and Ecological Criteria Division.	Groundwater discharge to surface water. Supplements above-referenced Ambient Water Criteria.
State of New Jersey Statutes and Rules	The New Jersey Pollutant Discharge Elimination System	N.J.A.C. 7:14A The New Jersey Pollutant Discharge Elimination System	Establishes standards for discharge of pollutants to surface and groundwaters.	New Jersey has a state approved program. Disposal of treated groundwater to surface water.
State of New Jersey Statutes and Rules	Groundwater Quality Standards	N.J.A.C. 7:9-6 Groundwater Quality Standards	Establishes standards for the protection of ambient groundwater quality. Used as the primary basis for setting numerical criteria for groundwater cleanups and discharges to groundwater.	Disposal of treated groundwater by reinjection.
State of New Jersey Statutes and Rules	Surface Water Quality Standards	N.J.A.C. 7:9B Surface Water Quality Standards	Establishes standards for the protection and enhancement of surface water resources.	Disposal of treated groundwater by discharge to surface water.

APPENDIX II
TABLE 10
Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Disposal of Hazardous Waste				
Federal Resource Conservation and Recovery Act	Identification and Listing of Hazardous Waste	40 CFR 261	Identifies solid wastes which are subject to regulation as hazardous wastes.	Generation os a hazardous waste possibly including spent carbon or contaminated soil. Hazardous waste must be handled and disposed of in accordance with RCRA. Chemical testing and characterization of waste required.
Federal Resource Conservation and Recovery Act	Standards Applicable to Generators of Hazardous Waste	40 CFR 262	Establishes requirements (e.g., EPA ID numbers and manifests) for generators of hazardous waste.	Waste that is characterized as hazardous.
Federal Resource Conservation and Recovery Act	Standards Applicable to Transporters of Hazardous Waste	40 CFR 263	Establishes standards which apply to persons transporting manifested hazardous waste within the United States.	Transport of waste that is characterized as hazardous.
Federal Resource Conservation and Recovery Act	Standards Applicable to Owners and Operators of Treatment, Storagem and Disposal Facilities	40 CFR 264	Establishes the minimum national standards which define acceptable management of hazardous waste.	Generation and storage of hazardous waste. May not apply to remediation sites if owner complies with requirements listed in 264, 1(j).
Federal Resource Conservation and Recovery Act	Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 265	Establishes minimum national standards that define the perios of interim status and until certification of final closure or if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.	Remedies should be consistent with the more stringent PART 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Federal Resource Conservation and Recovery Act	Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	40 CFR 267	Establishes minimum standards that define acceptable management of hazardous wastes for new land disposal facilities.	Remedies should be consistent with the more stringent PART 264 standards, as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of public health and welfare and the environment.
Federal Resource Conservation and Recovery Act	Land Disposal Restrictions	40 CFR 268	Identifies hazardous wastes which are restricted from land disposal. All listed and characteristic hazardous waste or soil or debris contaminated by a RCRA hazardous waste and removed from a CERCLA site may not be land disposed until treated as required by LDRs..	Waste disposed as a RCRA waste.
Disposal of Hazardous Waste (continued)				
Federal Resource Conservation and Recovery Act	Hazardous Waste Permit Program	40 CFR 270	Establishes provisions covering basic EPA permitting requirements.	A permit is not required for on-site CERCLA response actions. Substantive requirements are added in 40 CFR 264.

APPENDIX II
TABLE 10
Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
State of New Jersey Statutes and Rules	Hazardous Waste	N.J.A.C. 7:26C Hazardous Waste	Establishes rules for the operation of hazardous waste facilities in the state of New Jersey	
Federal Resource Conservation and Recovery Act	RCRA	40 CFR 265	Establishes organic air emission stndards for tanks, surface impoundments, and containers.	Applicable to hazardous waste treatment, storage, and disposal facilities (TSDFs) that receive new or re-issued permits or Class 3 modifications after 5 January 1995.
Federal Hazardous Material Transportation Act	Hazardous Materials Transportation Regulations	49 CFR 107, 171-177	Regulates transportation of hazardous materials.	An ARAR because response action would involve transportation of hazardous materials.
General Remediation				
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Superfund Amendments and Reauthorization Act of 1986 (SARA)	National Contingency Plan	40 CFR 300, Subpart E	Outlines procedures for remedial actions and for planning and implementing off-site removal actions.	
State of New Jersey Statutes and Rules	Technical Requirements for Site Remediation	N.J.A.C. 7:26E Technical Requirements for Site Remediation	Established minimum regulatory requiremetns for investigation and remediation of contaminated sites in New Jersey.	
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1904	Requiremetns for recording and reporting occupation injuries and illnesses	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1910	Specifies minimum requirements to maintain worker health and safety during hazardous waste operations. Includes training requiremtns and construction safety requirements.	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.
Federal Occupational Safety and Health Act	Worker Protection	29 CFR 1926	Safety and health regulations for construction.	Under 40 CFR 300.38, requirements of OSHA apply to all activities which fall under jusidiction of the National Contingency Plan.
On-site Construction Activities				
New Jersey Uniform Construction Code	Establishes standards for all new construction and renovation.	N.J.A.C. 5:23	Establishes standards for all new construction and renovation.	This may be an ARAR to the extent that new construction falls within the standards.

APPENDIX II
TABLE 10
Potential Action-Specific ARARs
Martin Aaron Superfund Site

Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Off-Gas Management				
Federal Clean Air Act	National Primary and Secondary Ambient Air Quality Standards	40 CFR 50	Establishes emission limits for six pollutants (SO2, PM10, CO, O3, NO2, and Pb).	Emission of ozone (O3) may be of concern for some remedial technologies utilizing ozone as an oxidizing agent. National limit is 8-hour, 0:08 ppm standard.
Federal Clean Air Act	Standards of Performance for New Stationary Sources	40 CFR 60	Provides emissions requirements for new staionary sources.	
Federal Clean Air Act	National Emission Standards for Hazardous Air Pollutants	40 CFR 61	Provides emission standards for 8 contaminants including benzene and vinyl chloride. Identifies 25 additional contaminants, as having serious health effects but does not provide emission standards for these contaminants.	
State of New Jersey Statutes and Rules	Standards for Hazardous Air Pollutants	N.J.A.C. 7:27 Air Pollution Control	Rule that govern the emitting of and such activities that result in the introductin of contaminants into the ambient atmosphere.	

APPENDIX II
TABLE 10
Potential Location-Specific ARARs
Martin Aaron Superfund Site

Type	Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
Within 100-Year Floodplain	New Jersey Flood Hazard Control Act	Floodplain Use and Limitations	N.J.A.C. 7:13 Flood Hazard Area Control	State standards for activities within flood plains.	An ARAR for those aspects of the site work that are within the flood plains.
Within 100-Year Floodplain	Federal National Environmental Policy Act (NEPA)	Statement of Procedures on Floodplain Management and Wetlands Protection	40 CFR 6, Appendix A	Establishes EPA policy and guidance for carrying out Executive Order 11988 - Protection of Floodplains and Executive Order Action must avoid adverse effects, minimize potential harm and restore and preserve natural and beneficial values of the floodplain.	Action will occur ina floodplain (lowlands and relatively flat areas adjoining inland) and coastal water and other flood-prone areas.
Wetlands	New Jersey Freshwater Protection Act		N.J.S.A. 13:9B-1; N.J.A.C. 7:7A	Require permits for regulated activity disturbing wetlands.	Potentially applicable for construction activities performed in the vicinity of a wetland or waterway.
Wetlands	Federal National Environmental Policy Act (NEPA)	Statement of Procedures on Floodplain Management and Wetlands Protection	40 CFR 6, Appendix A	11990 - Protection of Wetlands	Wetlands are defined by Executive Order 11990, Section 7 are present at or adjacent to the site.
Area Affecting Strem or River	Federal Clean Water Act	Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredge or Fill Material; Section 404 (c) Procedures; 404 Program Definitions; 404 State Program Regulations	40 CFR 230-233	Restricts discharge of dredged or fill material to wetlands or waters of the United States. Provides permitting program for situations with no other practical alternative.	Potentially applicable for construction activities performed in the vicinity of a wetland or waterway.
Area Affecting Strem or River	Federal Endangered and Non-Game Species Act	Protection of threatened and endangered species	N.J.S.A. 23:2A-1	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Area Affecting Strem or River	Federal Endangered Species Act	Protection of threatened and endangered species	16 USC 1531 et seq.; 40 CFR 400	Standards for the protection of threatened and endangered species.	Not an ARAR because no listed species identified at the site.
Area Affecting Strem or River	Federal Fish and Wildlife Conservation Act	Statement of Procedures for Non-game Fish and Wildlife Protection	16 USC 2901 et seq.	Establishes EPA policy and guidance for promoting the conservation of non-game fish and wildlife and their habitats. Action must protect fish or wildlife.	Potentially applicable for construction activities which may impact non-game fish and wildlife and their habitats.

APPENDIX II
TABLE 10
Potential Location-Specific ARARs
Martin Aaron Superfund Site

Type	Act/Authority	Criteria/Issues	Citation	Brief Description	Prerequisite
	Federal National Historic Preservation Act	Procedures for preservation of historical and archaeological data	16 USC 469 et seq.; 40 CFR 6301(c)	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	If historical or archaeological data could potentially be encountered during remediation.